(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

## (19) World Intellectual Property Organization

International Bureau



## **10/**540**410** . (1881) BYTTID KRITTI KRITTOLICH OCH BYTTI BYBY AKK OCH DYN 1871 (1871) BYTTI BYTTI BYTTI BYTTI

(43) International Publication Date 15 July 2004 (15.07.2004)

(10) International Publication Number WO 2004/059717 A1

H01L 21/336. (51) International Patent Classification7: 29/786

(21) International Application Number:

PCT/IB2003/005940

(22) International Filing Date:

11 December 2003 (11.12.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 0230140.6

24 December 2002 (24.12.2002) GB

- (71) Applicant (for all designated States except US): KONIN-KLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): GLASSE, Carl [GB/GB]; c/o Philips Intellectual Property & Standards, Cross Oak Lane, Redhill, Surrey RH1 5HA (GB). BROTHERTON, Stanley, D. [GB/GB]; c/o Philips Intellectual Property & Standards, Cross Oak Lane, Redhill, Surrey RH1 5HA (GB).

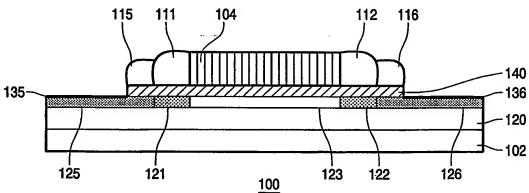
- (74) Agent: WILLIAMSON, Paul, L.; Philips Intellectual Property & Standards, Cross Oak Lane, Redhill, Surrey RH1 5HA (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## Declaration under Rule 4.17:

as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,

[Continued on next page]

(54) Title: THIN FILM TRANSISTOR, METHOD FOR PRODUCING A THIN FILM TRANSISTOR AND ELECTRONIC DE-VICE HAVING SUCH A TRANSISTOR



(57) Abstract: A thin film transistor (100) is mounted on a substrate (102), which is covered by a semiconductor layer (120). The semiconductor layer (120) has a first doped region (121) and a second doped region (122) with an undoped region (123) in between. In addition, the semiconductor layer (120) has a first further doped region (125) and a second further doped region (126) forming the source and drain of the thin film transistor (100) and being more heavily doped than the first doped region (121) and the second doped region (122). A part of the semiconductor layer (120) is covered by an oxide layer (140), which carries a conductive gate (104) over the undoped region (130) and a first spacer (111) and second spacer (112) over the first doped region (121) and the second doped region (122) respectively. In addition, the oxide layer (140) carries a first insulating spacer (125) and a second insulating spacer (126) to provide adequate insulation between the gate structure and a first conducting contact (135) and a second conducting contact (136) respectively. Because the first spacer (111), the second spacer (112), the first insulating spacer (115) and the second insulating spacer (116) are mounted on the oxide layer (140), a thin film transistor (100) with favourable parasitic conductivity characteristics is obtained.